lumns has a double termination; first, in the root of the fifth pair of cephalic nerves; and secondly, in the place where both columns unite into one round cord, and mutually decussate.

Between the lateral and the anterior columns there is interposed a layer of cineritious matter, constituting a continuous stratum from the *cauda equina* to the roots of the auditory nerves. There is also a septum, dividing the right and left tracts subservient to sensation in the region of the fourth ventricle, and apparently terminating at the point of decussation of these tracts; but, in reality, separating to allow of this decussation, and joining the central portion of the cord, which connects the posterior with the anterior columns, and extends from the *pons Varolii* to the *cauda equina*.

The anterior columns, constituting, at their upper part, the *corpora pyramidalia*, after their union and decussation, compose the motor columns of the spinal cord. They do not, in their course, unite or decussate with the lateral, or sensitive columns; decussation taking place only among the columns performing similar functions; that is, the motor columns with the motor, and the sensitive with the sensitive.

May 7, 1835.

Sir JOHN RENNIE, Knt., Vice-President, in the Chair.

The first paper read was entitled, "On the Elements of the Orbit of the Comet of Halley in 1759." By J. W. Lubbock, Esq., V.P. and Treasurer of the Royal Society.

In calculating the elements of Halley's comet, former astronomers have in general adopted the parabolic hypothesis, neglecting the reciprocal of the semi-axis major; and even in the more recent investigations of its orbit, no accurate value of this quantity has been employed. Mr. Lubbock, perceiving the serious effect which an error in the semi-axis major would occasion in the determination of the other elements, renewed these very laborious calculations, assuming as the value of this quantity that given by M. Pontécoulant, in his "Théorie analytique du Système du Monde;" taking also into account the alterations which the elements of the comet have undergone by the action of the planets, and likewise the effect of precession upon the longitude of the node, and of the perihelion. The author takes this opportunity of correcting the very erroneous statements that have been made respecting the results of his investigations, especially with regard to the time of the perihelion passage, which is, of course, very different from that of its actual appearance to spectators on the earth; although these two epochs are frequently confounded with one another.

The second was entitled, "Formulæ for computing the Longitude at Sea;" by William Dunlop, Esq. Communicated by the Secretaries.

These formulæ, in which the longitude and latitude of two points in a spherical surface, together with the arc of the great circle intercepted between them, are supposed to be given, furnish the means

of determining the longitude of any other point in that circle, from its latitude.

The third paper was entitled, "Hygrometrical Observations made on board His Majesty's surveying vessel Ætna." Communicated by Captain Beaufort, R.N., F.R.S.

These observations extend from the 27th of March to the 6th of July, 1834, and were made daily at 8 o'clock A.M., at noon, and at 4 o'clock P.M. They comprise the height of the barometer, the dew-point, degrees of dryness on the thermometrical, and of moisture on the hygrometrical scales, the elasticity of the vapour, and the number of grains of vapour in a cubic foot; with occasional remarks. A second series is also given, exhibiting the progress of solar radiation.

The fourth was a "Meteorological Register, from the 1st of January to the 1st of November, 1834," by Mr. Edward Barnett. Communicated by Capt. Beaufort, R.N, F.R.S.

These observations, made during a voyage across the Atlantic, relate chiefly to the temperatures of the air, and of the surface of the sea.

The fifth was a "Meteorological Register, kept on board His Majesty's Ship Thunder, between the 1st of January and the 30th of June, 1834," by R. Owen, Commander. Communicated by Captain Beaufort, R.N., F.R.S.

These observations relate to the state of the weather, the direction and force of the wind, and the heights of the thermometer, and of the marine and oil barometers.

May 14, 1835.

JOHN WILLIAM LUBBOCK, Esq., Vice-President and Treasurer, in the Chair.

A paper was read, entitled, "An Account of the Water of the Well *Zem-zem*, with a qualitative analysis of the same by Professor Faraday"; in a letter from John Davidson, Esq., to the Secretaries, and communicated by them.

The author having, during his stay at Jedda, the port of Mecca, succeeded in procuring about three quarts of the water from the well of *Zem-zem*, to which the Mahomedans ascribe a sacred character and extraordinary virtues; and wishing to preserve this water for the purposes of analysis, had the can in which it was contained carefully sealed; but, unfortunately, on its arrival in the London Docks, the can, notwithstanding the directions written on it, was opened, and the gas with which it was highly charged, and by which it held in solution a very large quantity of iron and other matters, was allowed to escape. The precipitate thrown down, in consequence of the loss of this gas, was found, by Professor Faraday, to consist of carbonate of protoxide of iron in the enormous proportion of 100·8 grains to the imperial pint of water. The clear fluid was neutral, and contained much muriate, and a little sulphate, but no carbonate; together with a little lime, potash, and soda. There was also found an alkaline ni-